

## ANSWERS General factors affecting solubility



### Acidic conditions

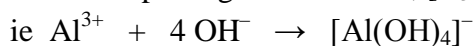
When the pH is less than 4,  $[\text{H}_3\text{O}^{+}] > [\text{OH}^{-}]$  and the  $[\text{H}_3\text{O}^{+}]$  ions react with  $\text{OH}^{-}$  ions from  $\text{Al}(\text{OH})_3$ .



The decrease in  $[\text{OH}^{-}]$  from the solubility equilibrium causes the position of equilibrium to shift further to the right so that more  $\text{Al}(\text{OH})_3$  is dissolved.

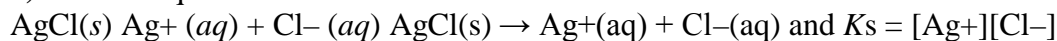
### Basic conditions

When the pH is greater than 10,  $[\text{H}_3\text{O}^{+}] < [\text{OH}^{-}]$  and the  $\text{OH}^{-}$  ions react with  $\text{Al}^{3+}$  ions from  $[\text{Al}(\text{OH})_4]^{-}$



The decrease in  $[\text{Al}^{3+}]$  from the solubility equilibrium causes the position of equilibrium to shift further to the right so that more  $\text{Al}(\text{OH})_3$  is dissolved.

2)  $K_s$  is an equilibrium constant for the reaction



More solid dissolves when the temperature is increased as equilibrium shifts in the endothermic direction, which means it shifts to the right and increases the concentration of ions in solution. This increases  $K_s$ .